

What is claimed is:

1. A method for controlling a vehicle powertrain including a transmission having an input speed, an internal combustion engine having an output and a throttle position, and an input clutch having a variable torque capacity for driveably
5 connecting the input and output, the method comprising the steps of:
determining a current input speed;
determining a value representing requested powertrain output;
producing an indication that a vehicle launch condition has been initiated;
determining a target input speed based on the value representing requested
10 powertrain output;
determining a variable pressure for actuating the input clutch during the launch condition based on a difference between the current input speed and the target input speed; and
using the variable pressure to control the torque capacity of the input clutch
15 during the launch condition.
2. The method of claim 1, further comprising the steps of:
determining a current vehicle speed;
determining a performance adder based on the current vehicle speed; and
20 combining the performance adder with the target input speed before using the variable pressure to control the torque capacity of the input clutch.
3. The method of claim 1, wherein the step of producing an indication that a vehicle launch condition has been initiated further comprises the steps of :
25 comparing the current input speed and the target input speed; and
producing the indication when current input speed exceeds the target input speed.

4. The method of claim 1, wherein the transmission has a current gear, the method further comprising the steps of:

determining the current gear in which the transmission is operating;

determining a target motor output torque based on the current gear and throttle
5 position; and

using the target motor output torque to control the torque produced by the motor.

5. The method of claim 1, wherein the transmission has a current gear, the
10 method further comprising the steps of:

determining the current gear in which the transmission is operating;

determining a target motor output torque based on the current gear and throttle
position; and

using the target motor output torque to control the magnitude of electric current
15 applied to a field winding of the motor.

6. The method of claim 1, further comprising the steps of:

determining a current vehicle speed;

determining a performance multiplier based on the vehicle speed; and

20 determining a target motor output torque as the product resulting from
multiplying the performance multiplier and the target motor output torque based on the
current gear and throttle position.

7. The method of claim 1 wherein the step of determining a value
25 representing requested powertrain output comprises determining an engine torque
based at least in part on a position of the accelerator pedal.

8. The method of claim 1 wherein the step of determining a value representing requested powertrain output comprises determining an engine torque based at least in part on a position of the engine throttle.

5 9. The method of claim 1, further comprising the steps of :
determining whether the variable pressure is increasing; and
limiting the time rate of increase of the variable pressure.

10 10. A method for controlling a vehicle powertrain including a transmission
having an input speed, an internal combustion engine having an output and a throttle
position, and an input clutch having a variable torque capacity for driveably
connecting the input and output, the method comprising the steps of:

determining a current input speed;
determining a value representing requested powertrain output;
15 producing an indication that a vehicle launch condition has been initiated;
determining a target input speed based on the value representing requested
powertrain output;
determining a variable pressure for actuating the input clutch during the launch
condition based on a difference between the current input speed and the target input
20 speed;
using the variable pressure to control the torque capacity of the input clutch
during the launch condition;
determining the current gear in which the transmission is operating;
determining a target motor output torque based on the current gear and throttle
25 position; and
using the target motor output torque to control the torque produced by the
motor.

11. The method of claim 10, further comprising the steps of:

determining a current vehicle speed;
determining a performance adder based on the current vehicle speed; and
combining the performance adder with the target input speed before using the
variable pressure to control the torque capacity of the input clutch.

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13. The method of claim 10, wherein the steps of using the target motor
output torque to control the torque produced by the motor further comprises using the
target motor output torque to control the magnitude of electric current applied to a
field winding of the motor.

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14. The method of claim 10, further comprising the steps of:
determining a current vehicle speed;
determining a performance multiplier based on vehicle speed; and
determining a target motor output torque as the product resulting from
15 multiplying the performance multiplier and the target motor output torque based on the
current gear and throttle position.

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15. The method of claim 10 wherein the step of determining a value
representing requested powertrain output comprises the step of determining an engine
torque based at least in part on a position of the accelerator pedal.

16. The method of claim 10 wherein the step of determining a value
representing requested powertrain output comprises the step of determining an engine
torque based at least in part on a position of the engine throttle.

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17. The method of claim 1, further comprising the steps of :
determining whether the variable pressure is increasing; and
limiting the time rate of increase of the variable pressure.

18. A method for controlling a vehicle powertrain including a transmission having an input speed, an electric motor producing torque that drives the input, an internal combustion engine having an output and throttle position, an input clutch having a variable torque capacity for driveably connecting the input and output, and an
5 electronic controller communicating with the transmission and motor, the method comprising the steps of:

repetitively determining the current input speed;
repetitively determining the engine throttle position;
generating a signal that a vehicle launch condition has been initiated;
10 repetitively determining a target input speed based on the engine throttle position;
repetitively determining a variable pressure for actuating the input clutch during the launch condition based on a difference between the current input speed and the target input speed; and
15 generating a command to change the at the input clutch based on the determined variable pressure, whereby torque capacity of the input clutch changes during the launch condition.

19. The method of claim 18, further comprising the steps of:
20 repetitively determining a current vehicle speed;
repetitively determining a performance adder based on the current vehicle speed; and
repetitively combining the performance adder with the target input speed before using the variable pressure to control the torque capacity of the input clutch.

20. The method of claim 18, wherein the transmission has a current gear, the method further comprising the steps of:
25 repetitively determining the current gear in which the transmission is operating;

repetitively determining a target motor output torque based on the current gear and throttle position; and

generating a command to change the torque produced by the motor based on the target motor output torque.

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21. The method of claim 18 further comprising the steps of:

repetitively determining the current gear in which the transmission is operating;

repetitively determining a target motor output torque based on the current gear and throttle position; and

10 generating a command to change the magnitude of electric current applied to a field winding of the motor the torque in response to the target motor output torque.

22. The method of claim 18, further comprising the steps of:

repetitively determining a current vehicle speed;

15 determining a performance multiplier based on vehicle speed; and

determining a target motor output torque as the product resulting from multiplying the performance multiplier and the target motor output torque based on the current gear and throttle position.

20 23. The method of claim 18, further comprising the steps of :

repetitively determining whether the variable pressure is increasing; and

limiting the time rate of increase of the variable pressure.